

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Stefan J. Murry et al.

Serial No.: 09/855.853

Filed: May 15, 2001

For: VCSEL Assembly with Edge-Receiving Optical Devices

Confirmation No.: 1173

Group Art Unit: 2828

Examiner: Armando Rodriguez

Atty. Docket No.: PAT013US

INFORMAL COMMUNICATION WITH EXAMINER

DO NOT ENTER

VIA FAX 703-746-4795

ATTN: EXAMINER ARMANDO RODRIGUEZ

Examiner Rodriguez:

As we discussed, attached are some draft comments and claims. Could you please review the following and give me a call when you get a chance:

1. Claims 48-72 are pending, not 42-72, as indicated in the Office Action.
2. You rejected independent claims 48 and 62 under § 102(e) based on Tabuki. Note that claims 48 and 62 claim "at least one surface-emitting laser" mounted on its edge on the optical bench substrate. This is as opposed to an edge-emitting laser mounted on its surface on a substrate. In the edge-emitting laser, radiation is emitted parallel to the active (gain) region layer, through an edge that is perpendicular to the active region. In a surface-emitting laser, light is emitted parallel to the direction of epi-growth, i.e. perpendicular to the active region and the surface through which it exits. See Specification, page 2, lines 2-5; page 8, lines 15-19, 26-27; and Fig. 3, showing the active region layer 14 is perpendicular to the direction of

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emitted radiation. Tabuki shows only "semiconductor laser" 200. Fig. 28A, col. There is no suggestion that laser 200 is a surface emitting laser. The inventor Murry confirms that it appears to be a standard edge-emitting laser, in which the active region is parallel with the emitted radiation and with the surface of substrate 100. In any event there is no suggestion in Tabuki that laser 200 could have the active region parallel with the emitting edge and perpendicular to substrate 100.

3. I propose amending independent claims 48 and 62 to explicitly claim the aspects that distinguish a surface-emitting laser from an edge-emitting laser. I would propose amending claim 48 as follows:

48. (currently amended) A method for aligning and mounting at least one surface-emitting laser with respect to at least one edge-receiving optical device, the method comprising the steps of:

- 12 (a) providing an optical bench substrate having a mounting surface in the x-y coordinate plane, the mounting surface having a plurality of alignment features defined therein, the optical bench substrate having at least one edge-receiving optical device mounted on the mounting surface, wherein:

each of the at least one edge-receiving optical device has an input edge in the x-z coordinate plane, each said input edge being perpendicular to both the mounting surface and to the substrate of the at least one edge-receiving optical device, whereby each of the at least one edge-receiving optical device is adapted to receive light traveling in the y direction into its input edge;

each of the at least one edge-receiving optical device is for conditioning light traveling in the y-direction and received at its input edge;

the at least one surface-emitting laser comprises a primary epi surface from which laser radiation is emitted in a direction perpendicular to the primary epi surface and, a mounting edge perpendicular to the primary epi surface, and an active region parallel to the primary epi surface and perpendicular to the direction in which the laser radiation is emitted; and

the plurality of alignment features are for receiving the mounting edge of the at least one surface-emitting laser and for securing the at least one surface-emitting laser from movement in the x direction and in the y direction; and

- (b) mounting the at least one surface-emitting laser, at its mounting edge, on the mounting surface and within said plurality of alignment features so that the at least one surface-emitting laser is secured from movement in the x direction and in the y direction, wherein the plurality of alignment features are positioned on said mounting surface with respect to the at least one edge-receiving optical device so that: the primary epi surface of the at least one surface-emitting laser is in the x-z coordinate plane and the at least one surface-emitting laser, when activated, will emit laser

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radiation in the y direction and into the input edge of the at least one edge-receiving optical device, respectively, whereby the at least-one surface-emitting laser is directly optically coupled to the at least one edge-receiving optical device, respectively.

4. I also submit that, as discussed with the Examiner, the feature of dependent claims 60 and 63 is clearly not suggested by the cited references, namely "the step of monolithically fabricating the at least one edge-receiving optical device on the mounting surface of the optical bench substrate". Therefore, Applicant submits that a new independent claim incorporating the language of dependent claims 60 and 63, and their respective parent claims 48 and 62, would also be allowable.

Respectfully submitted,

Date: _____

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